

# Operator's Guide



PS300

## Compact Pedestrian Sweeper

Part No 66473-OG

Revision Level 06

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## Foreword

Congratulations on your choice of a Madvac PS300 Pedestrian sweeper to complement your litter collection operation. This sweeper has been designed and manufactured to meet the needs of a discriminating buyer for the vacuum collecting of litter.

Safe, efficient and trouble free operation of your Madvac Pedestrian sweeper requires that you and anyone else who will be operating or maintaining the machine, read and understand the safety, operation, maintenance and troubleshooting information contained in the Operator's Manual.



This manual is applicable to all Model PS300 machines built by Allianz Madvac Inc. Use the Table of Contents or Index as a guide when searching for specific information.




Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Madvac dealer if you need assistance or information.

**OPERATOR ORIENTATION** - The directions left, right, front and rear, as mentioned throughout this manual, are as seen from the Operator's position and facing in the direction of travel.

It is important that only Genuine Madvac Spare Parts are used when servicing and maintaining the sweeper. This is especially important for consumables (filters, brooms, etc.), as the use of non-genuine parts may cause premature failure and invalidation of warranty.

When carrying out maintenance or part replacement, additional explanatory illustrations can be found in the Parts Section, which shows and lists hardware, and availability of spares with the orientation and positions of the various components.

## Warnings, Cautions and Notes used in this manual

Symbol	Heading	Significance
	<b>WARNING</b>	Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. The use of this symbol is limited to the most extreme situations, typically for machine components, which for functionality cannot be guarded.
	<b>CAUTION</b>	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. This includes hazards that are exposed when guards are removed. This symbol may also be used to alert against unsafe practices.
	<b>NOTE</b>	Indicates supplementary information useful for the efficient operation and maintenance of the unit, while not normally presenting any safety hazards.

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Every endeavour has been made to ensure that the information contained in this Operators Guide is correct, but due to continuous product development, the Company reserves the right to alter its contents without notice. This document should not be interpreted as being part of a formal contract.

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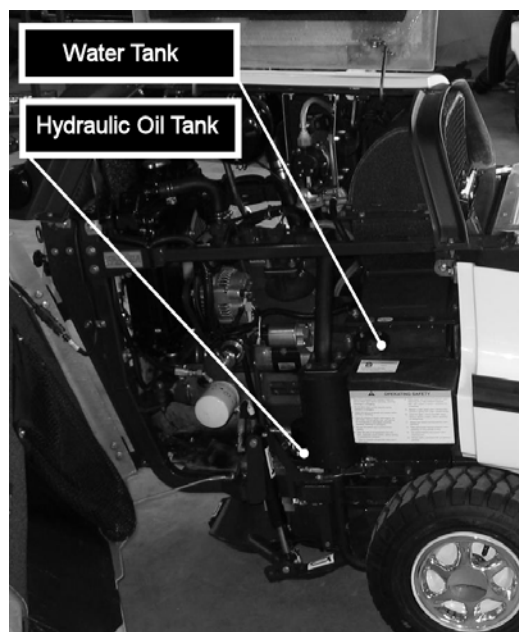
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## INTERNATIONAL SYMBOLS

### Conforming to ISO 3767

Graphical symbols are used to indicate the water, fuel and hydraulic oil tank filler ports and air cleaner servicing instructions.

Their location and descriptions are shown below.



1. Water tank filler ports



2. Hydraulic oil tank filler



3. Fuel tank (diesel) filler

4. Engine air cleaner instructions. Use only genuine Madvac replacement air cleaner elements and refer to Chapter 6 of this guide for servicing recommendations.

## Safety Symbol Descriptions



Safety alert symbol

Read Operator's Guide



Keep clear of brushes



Release radiator cap carefully when hot to avoid scalding



Keep at least 3 feet (1 meter) away from the machine



Wear hearing protection when working in this area



## **SAFETY**

YOU are responsible for the SAFE operation and maintenance of your MADVAC.

YOU must ensure that you and anyone else who is going to operate, maintain or work around the MADVAC be familiar with the operating and maintenance procedures and related SAFETY information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the Vacuum.

Remember, YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that EVERYONE operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- The Madvac PS 300 is intended for use as a suction and sweeping vehicle only. The vehicle must not be used for any other purpose than that described. The vehicle can cause serious injury if utilized improperly. The vehicle must not be used for sweeping explosive powders, explosive or corrosive materials, flammable liquids or any other hazardous substances.
- MADVAC owners must give operating instructions to operators or employees before allowing them to operate the Vacuum, and at least annually thereafter per OSHA regulation 1928.57. The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think SAFETY! Work SAFELY!

### **General Safety**

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining adjusting or unplugging the Madvac.
2. Only trained competent persons shall operate the machine. An untrained operator is not qualified to operate the machine.
3. Have a first-aid kit available for use should the need arise and know how to use it.
4. Do not allow riders.

5. Have a fire extinguisher available for use should the need arise and know how to use it.
6. Wear appropriate protective gear. This list includes but is not limited to:
  - A hard hat
  - Protective boots with slip resistant soles
  - Protective goggles
  - Heavy gloves
  - Hearing protection
  - Filter Mask
7. Place all controls in neutral, stop engine, set park brake, remove ignition key, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
8. Wear appropriate hearing protection when operating for long periods of time.
9. Review safety related items with all personnel annually.

### Operating Safety

1. Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting or unplugging.
2. Do not allow riders on the machine during operation or transport.
3. Install and secure all guards and shields before starting or operating.
4. Place all controls in neutral, stop engine, set park brake, remove ignition key, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
5. Be sure all controls are in neutral before starting.
6. Clear the area of all bystanders' front and back, especially small children, before starting or emptying the container.
7. Keep all hydraulic components clean and in good repair.
8. Wear proper eye and hand protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop.
9. Maintain a safe speed when making sharp corners or going over rough, uneven terrain.
10. Clean the lights, mirrors and the flashing strobe before operating or transporting.
11. Always use warning flashers when operating.
12. Wear appropriate hearing protection when operating for long periods of time.
13. Use flashers when emptying trash.
14. Review safety instructions with all operators annually.

## **Hydraulic Safety**

1. Make sure that all components in the hydraulic system are kept in good condition and are clean.
2. Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.
3. Relieve pressure before working on hydraulic system.
4. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.
5. Wear proper hand and eye protection when searching for high-pressure hydraulic leaks. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
6. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.
7. Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are not damaged.

## **Maintenance Safety**

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the Madvac.
2. Place all controls in neutral, stop engine, set park brake, remove ignition key, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Follow good shop practices:
  - Keep service areas clean and dry
  - Be sure electrical outlets and tools are properly grounded
  - Use adequate light for the job at hand.
4. Before applying pressure to hydraulic system make sure that all connections are tight and that all hoses and fittings are in good condition.
5. Keep hands, feet, clothing and hair away from all moving and/or rotating parts.
6. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments or emptying.
7. Do not attempt any adjustment or maintenance to any system of the machine when the machine is in motion.
8. Make sure that all guards and shields are properly installed and secured before operating the machine.



9. Securely support the machine using blocks or safety stands before working beneath it or changing tires.
10. Store and transfer fuel, solvents, cleaners or any flammable liquids only in safety standard approved containers.

## Transport Safety

1. Read and understand all the information in the Operator's Manual regarding safety and operating procedures before using the Madvac.
2. Always travel at a safe speed. Use extra caution when going around corners and when meeting traffic.
3. Make sure the flashing strobe and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking or oncoming traffic, and by bystanders.
4. Do not allow riders on any part of the machine during either field operation or road and highway travel.
5. Always use hazard warning flashers and the rotating beacon on the Madvac when transporting unless prohibited by law.

## Tire Safety

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion, which may result in serious injury or death.
2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
3. Have a qualified tire dealer or repair service perform required tire maintenance.

## Storage Safety

1. Store unit in an area away from human activity.
2. Do not permit children to play on or around the stored vacuum.

## Refueling Safety

1. Handle fuel with care. It is highly flammable.
2. Allow engine to cool for 5 minutes before refueling. Clean up spilled fuel before restarting engine.
3. Do not refuel the machine while smoking or when near open flame or sparks.
4. Fill fuel tank outdoors.
5. Prevent fires by keeping machine clean of accumulated trash, grease and debris.

## **Battery Safety**

1. Keep all sparks and flames away from batteries, as gas given off by electrolyte is explosive.
2. Avoid contact with battery electrolyte: wash off any spilled electrolyte immediately.
3. Wear safety glasses when working near batteries.
4. To avoid electrolyte loss, do not tip batteries more than 45 degrees.
5. To avoid injury from spark or short circuit, disconnect battery ground cable before servicing any part of electrical system.

## **Safety Signs**

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs are available from your distributor or the factory.

## **How to Install Safety Signs**

- Be sure that the installation area is clean and dry.
- Decide on the exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.



## Sign-Off Form

Madvac International Inc. follows the general Safety Standards specified by the Society of Automotive Engineers (SAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will operate or maintain the Madvac pedestrian sweeper must read and clearly understand all the safety, operating and maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until this manual has been fully reviewed. Review the information in this manual annually before the start of each season.

We recommend periodic reviews of safety information and operating instructions for all of your equipment. We believe that an untrained operator is unqualified to operate this machine.

A sign-off form is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment.

**DATE** \_\_\_\_\_ **EMPLOYEE'S SIGNATURE** \_\_\_\_\_  
**EMPLOYER'S SIGNATURE** \_\_\_\_\_

## SAFETY SIGNS

The types of safety signs and locations on the equipment are shown in the illustrations below. Good safety practice requires that you familiarize yourself with the various Safety Signs, the type of warning and the area (or particular function related to that area) which requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!



Figure 1. Hydraulic Safety Location.



Figure 2. Refueling Safety Location.

**REMEMBER** - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

## SAFETY SIGN LOCATIONS

The types of safety signs and locations on the equipment are shown in the illustrations below. Good safety practice requires that you familiarize yourself with the various Safety Signs, the type of warning and the area (or particular function related to that area) which requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!



Figure 3. Operating Safety Location.



Figure 4. Panel Filter Safety Location.

**REMEMBER** - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

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# CHAPTER 1

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## General Arrangement

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## GENERAL ARRANGEMENT

Expertly designed to meet the cleaning challenges of today's busy streets, the Madvac PS300 pedestrian-friendly sweeper is a high-profile, cost-efficient cleaning machine that safely and effectively cleans city sidewalks, walkways and streets. The sweeper is built to withstand everyday operation as well as to sweep and pickup debris within its published ratings and specifications.

### A. Engine

Low-emission Kubota Z482-E twin-cylinder, 479-cc liquid-cooled diesel engine producing 13.9 BHP (10.4 kw). Electric starter. Engine is rear-mounted keeping it clear of obstructions, ensuring superior cooling, engine longevity and easier access for routine maintenance.

### B. Transmission

Hydrostatic drive system. Piston pump with infinitely variable displacement in both forward and reverse. Two wheel-motors.

### C. Brake system

Dynamic braking on hydrostatic transmission. Hand-operated parking brake with automotive-type disc brakes on drive wheels.

### D. Electrical system

12-volt with 40-amp alternator and heavy-duty battery.

### E. Lighting system

Two front headlights, strobe light, rear/side lights.

### F. Safety system

Horn, back-up alarm (optional), soft reverse (optional), emergency shut-off switch, diesel safety shutdown (optional).

### G. Air filter

Donaldson-type high-capacity, cyclonic air cleaner.

### H. Instruments

Ammeter, hour meter, electric fuel gauge, oil pressure, water temperature, emergency shut-off switch.

### I. Fuel

Diesel held in 2.64 US gallon capacity (10 L) tank with electric fuel gauge.

**J. Tires**

Two 16-inch 4.80/8-B sawtooth tires.

**K. Hydraulic stabilizer wheel**

Keeps front brushes in contact with the surface on steep inclines up to 38% gradability.

**L. Ground speed**

Infinitely variable speed from 0 to 6.5 mph (0 to 10.5 km/h) in forward, and 0 to 3 mph (0 to 5 km/h) in reverse. Right and left-handed speed controls.

**M. Frame**

Square structural steel tube 1.5 in. x 1.5 in. (38 mm x 38 mm) 14-gauge reinforced at stress points. Fully welded 14 and 18-gauge steel sheet, reinforced at stress points.

**N. Finish**

Double-layer baked powder coating electrostatically applied.

**O. Vacuum system**

Litter does not pass through the vacuum fan. Patented straight-through suction with no restrictions. Vacuum air-stream flows through the collection bag in which the litter is compacted.

**P. Collection capacity**

Large capacity container holding a 40-gallon disposable or re-usable collection bag in which 60 gallons of litter is compacted. Quick access for bag change.

**Q. Pick-up system**

Vacuum fan mounted directly on the main engine. High-performance fan with speeds ranging from 0 to 2,800 RPM.

**R. Static pressure**

30-inch water pressure gauge at closed inlet.

**S. Two-stage dust filtering system**

1st stage - Fibrous collection bag filters dust and debris. 2nd stage - Four washable, heavy-duty quick-change panel filters provide an area of 265 square feet (25 m<sup>2</sup>) filtering particles up to approximately 2 microns (optional filter) and ensuring the machine's optimal performance. Standard filter is 10 microns.

**T. Disinfectant system**

Pump sprays water solution directly onto the front brushes and a fine mist in the litter container.

## U. **Water system**

Balanced on the center of gravity, a molded 13 US-gallon (50 L) water tank features built-in filters, water drain and automatic shutoff when low water level is reached.

## V. **Brushes**

Operator-controlled 18-inch (457 mm) diameter variable-speed self-leveling polypropylene brushes. Retractable for transport, height adjustable for pressure and wear. Optional one-touch hydraulic up/down brushes and vacuum head.

## W. **Sweeping width**

Two (2) brushes covering a total width of 48 inches (1.20 m).

## X. **Options**

Fold-away ride-on seat (with mirrors), wanderhose, programmable customized voice messaging system, 2-micron panel filters, dog excrement vacuum system, catalytic converter, custom colors and graphics.

## Y. **Dimensions**

Length: 99 in. (2,515 mm). 119 in. (3,023 mm) with ride-on seat.

Width: 34 in. (864 mm).

Height: 44 in. (1,118 mm).

Weight: 1,143 lbs. (520 kg) wet.

## Z. **Warranties**

1-year parts and labor warranty.

Lifetime warranty on impeller fan and casing.

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## CHAPTER

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# 2

## Controls

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## CONTROLS

Before starting to work, all operators should familiarize themselves with the location and function of the controls. Locate the machine in a large open area to provide unobstructed maneuvering during the training period.

### INSTRUMENT PANEL

An instrument panel is located at the back of the machine.



Figure 5. Instruments - Gauges.

#### 1. Gauges:

- a. **Hour Meter:** Displays the total operating hours of the machine. The hour meter is electrically powered and runs whenever the ignition switch is on.
- b. **Fuel Gauge:** Displays the fuel level in tank.
- c. **Oil Pressure Gauge:** Displays the engine oil pressure. The pressure should always remain in the 35 to 60 psi range when operating at rated RPM. Should it drop below that, stop immediately. Determine the cause before resuming operation.
- d. **Engine Coolant Temperature Gauge:** Displays the engine coolant temperature. The temperature indicator should always be in the green band between 190° and 210° F (90° and 100°C) when operating at the rated RPM. Should it go over this range, stop the machine immediately and clean the radiator, oil cooler and the space between the radiator and cooler.
- e. **Ammeter (Voltage) Gauge:** Displays the amount of charge going to the battery.

### 2. Switches:



Figure 6. Switches.

- a. **High side dump (optional):** This rocker switch raises and lowers the trash basket. The throttle should be set to the lowest RPM and the hood must be opened before raising the trash basket.
- b. **Brushes:** This rocker switch controls the electrical power to the brushes. Depress the bottom portion of the switch to turn the brushes Off. Depress the top portion to turn the brushes On. When the switch is turned On, an orange light in the upper portion of the switch will illuminate.
- c. **Water spray:** This rocker switch controls the electrical power to the water spray pump. Depress the bottom portion of the switch to turn the pump Off. Depress the top portion to turn the water spray pump On. When the switch is turned On, an orange light in the upper portion of the switch will illuminate. The water spray pump will turn off automatically when the water level is low.
- d. **Full / Soft Reverse:** This rocker switch controls the electrical power to the reverse solenoid. Depress the bottom portion of the switch to turn the full reverse Off (soft reverse mode). Depress the top portion to turn full reverse On. When the switch is turned On, an orange light in the upper portion of the switch will illuminate and a warning beeper will sound.
- e. **Lights:** This rocker switch controls the lights on the machine. Depress the bottom portion of the switch to turn the lights Off. Depress the top portion of the switch to turn the headlights On. The orange light on the rocker switch will illuminate in the On position.
- f. **Warning Lights:** This rocker switch controls the warning flashing strobe light. Depress the upper portion of the switch to activate. Depress the lower portion to deactivate. The orange light on the rocker switch will illuminate in the On position.
- g. **Message/Horn:** This two-position rocker switch controls the horn and the optional voice message. Depress the lower portion of the switch to activate the horn; this position will spring back to the center Off position. Depress the upper portion of the switch to activate the voice message system.
- h. **Emergency:** This red button switch controls the main power for the machine. Push the button to shut down the machine in case of emergency. Pull the button up before restarting the machine.

## OPERATOR CONTROLS

### 1. Operator Station Controls:

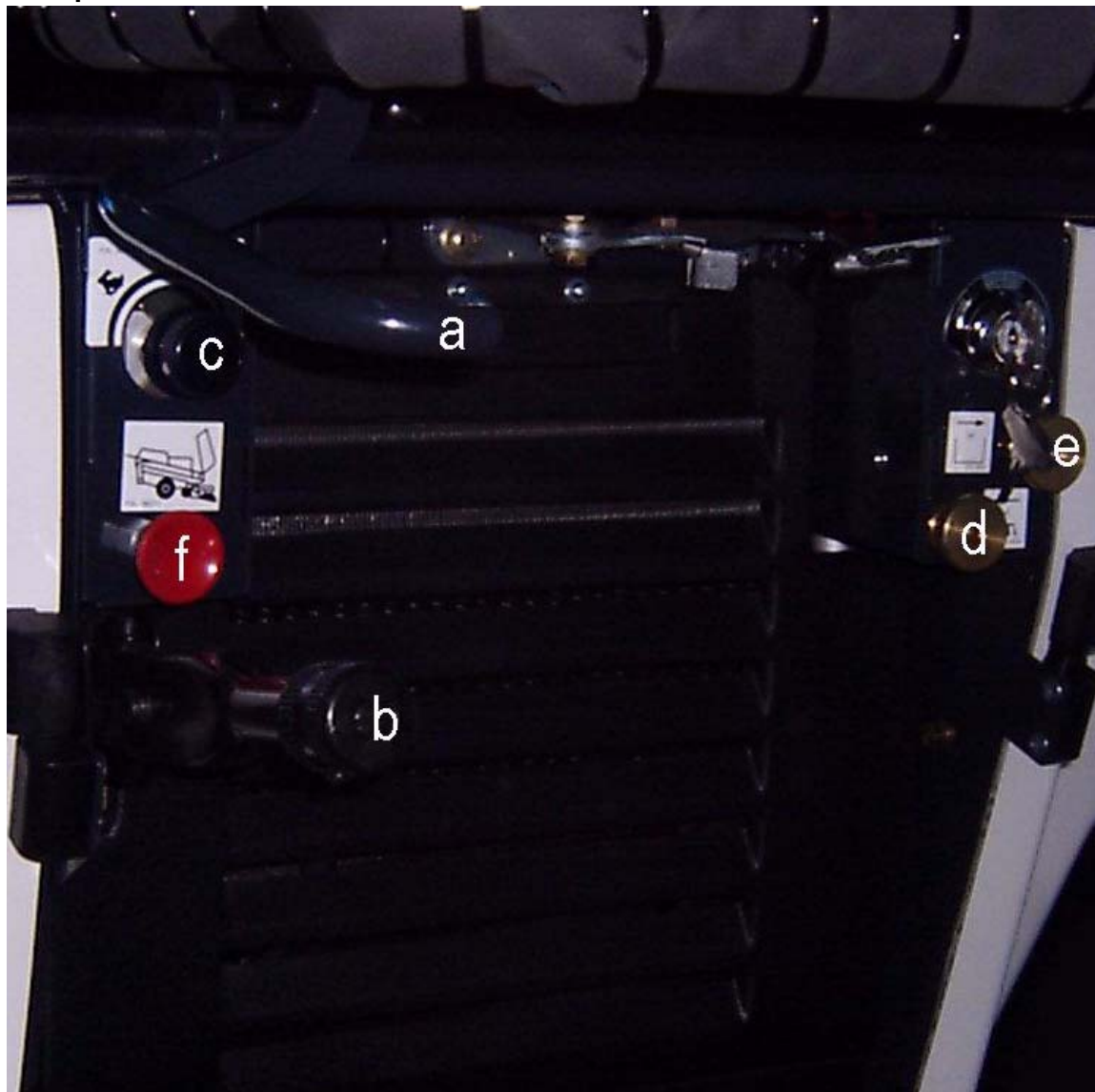


Figure 7. Controls.

- a. **Forward/Reverse Lever:** This lever controls and activates the speed and direction of the machine. It must be in its centered position to start the engine. Gently squeezing the lever up will move the machine in the forward direction. Squeezing the lever further will increase the forward speed. To move in reverse, depress the lever with the thumbs. Depress it further to increase rearward speed. Release the lever and the machine will brake and stop.
- b. **Hand Brake:** This lever is the parking and emergency brake. Pull the lever up to apply the brakes on the drive wheels. Push the lever down to release the parking brakes.

- c. **Brush Speed:** This rotary valve controls the speed of the two brushes. Turn the knob clockwise to increase the speed of the brushes. Turn counterclockwise to reduce the speed of the brushes.
- d. **Brush water spray valve:** This rotary valve controls the flow of water to the two (2) spray nozzles on the front brushes. Turn the valve clockwise to increase water flow; counterclockwise to reduce flow. Note that water flows only when the water pump is turned on.
- e. **Container water spray valve:** This rotary valve controls the flow of water to the spray nozzle inside the litter container. Turn the valve clockwise to increase water flow; counterclockwise to reduce flow. Note that water flows only when the water pump is turned on.
- f. **Container Latch:** This lever controls the opening of the litter container cover. Pull the lever to release the container latch. Close the cover to latch.

### ENGINE COMPARTMENT

1. **Tow Valve:** The piston pump for the traction drive system on the back of the engine is equipped with a "Flow Valve" to bypass oil around the pump. By bypassing the oil, the unit can be towed. Turn the valve on top of the pump at right angles to the axis of the pump before towing. Turn the valve parallel to the axis to move the unit under its own power.

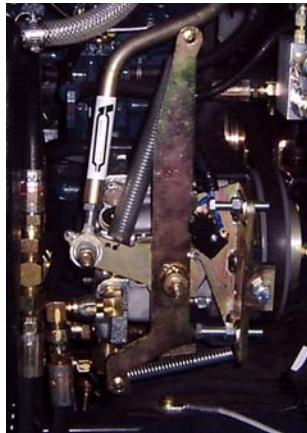


Figure 8. Tow Valve

2. **Fuse Block:** A fuse panel for all the electrical systems is located behind the control panel. Swing the panel up to gain access to the fuse block. Refer to the Maintenance Section and Electrical Schematic for fuse size and circuit definition.

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## CHAPTER 3

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### Operation

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## OPERATING SAFETY



- Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting or unplugging.
- Do not allow riders on the machine during operation or transport.
- Install and secure all guards and shields before starting or operating.
- Place all controls in neutral, stop engine, set park brake, remove ignition key, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Be sure all controls are in neutral before starting.
- Clear the area of all bystanders front and back, especially small children, before starting.
- Keep all hydraulic components clean and in good repair.
- Wear proper eye and hand protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop.
- Maintain a safe speed when making sharp corners or going over rough, uneven terrain.
- Clean the lights and flashing warning light before operating or transporting.
- Always use warning flasher light when operating.
- Wear appropriate hearing protection when operating for long periods of time.
- Review safety instructions with all operators annually.

## TO THE NEW OPERATOR OR OWNER

The Madvac PS300 pedestrian sweeper is designed to sweep and vacuum up a wide variety of trash, debris and other materials from around a variety of obstructions, it has the capability to pick up virtually anything that will fit through the intake tube. Its unique design provides for self-compacting as the trash enters the collecting bag. The two-wheeled stance provides virtually unlimited maneuverability around almost any obstacle. Trash is collected in the container in the front of the machine.

It is the responsibility of the owner or operator to read this manual before starting. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the environment.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum field efficiency. By following the operating instructions in conjunction with a good maintenance program, your PS300 sweeper will provide many years of trouble-free service.

## **HOW THE SWEEPER WORKS**

The Madvac PS300 is a compact pedestrian sweeper especially designed for litter collection and sweeping in areas with high density of pedestrian traffic.

Two brushes located at the front of the machine sweep the litter into the center of its path, where it is picked up by the vacuum system through a nozzle. The Madvac patented straight through suction of the PS300 allows the operator to pick up virtually any litter that fits through the suction nozzle because no litter passes through the fan.

The airflow of the vacuum system carries the debris into a large container. The collector bag inside the container is air permeable; it therefore retains the trash and lets the air pass through. The PS300 is equipped with a filtration system that consists of four large panel filters that retain the fine particles and dust before the air goes through the fan.

The clean air then goes through the fan and is expelled outside. The PS300 is also equipped with a water spray system. It is designed to damp down dust and prevent the formation of clouds of dust where the brushes are sweeping. The filtration system on the PS300 does not require water to function properly. Power for the PS300 is provided by a diesel engine. The forward or backward movement is accomplished by using a variable displacement hydrostatic pump-to-pump hydraulic oil to drive the two drive wheel motors on which the wheels are mounted. The operator can control the forward and backward

travel using a single lever. An auxiliary hydraulic pump supplies hydraulic oil to power the brooms of the machine.

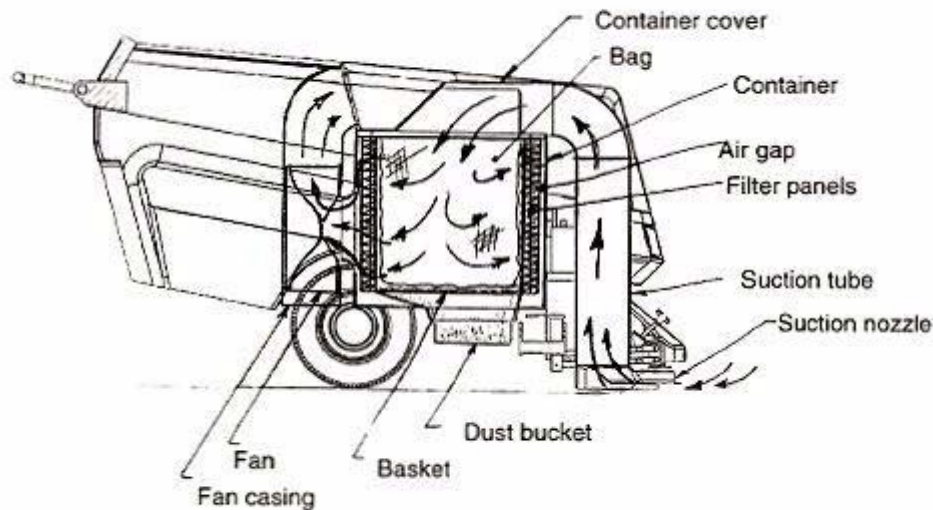


Figure 8. Machine components.

### **SWEEPER BREAK-IN**

Although the sweeper has been run at the factory, an inspection procedure has been developed to ensure the integrity of the mechanical and hydraulic systems. When using the sweeper for the first time, follow these procedures.

#### **A. Before Starting:**

1. Read the engine and Madvac Operator's Manual.

#### **B. At 1/2, 2, 5 and 10 Hours:**

1. Check all machine fluid levels: Fuel, coolant, hydraulic oil, and engine oil. Refuel or top up fluid level as required.
2. Re-torque wheel bolts.
3. Check all hydraulic fittings and components for leaks. Tighten if required to stop any leaks.
4. Check for loose hardware. Tighten to specified torque.
5. Check the speed/direction control lever to be sure it is set for operator comfort. Adjust as required.
6. Check the dust filters and clean if required.

7. Lubricate the points as outlined in Chapter 6 "Routine Maintenance".
8. Proceed to the service schedule outlined in Chapter 6 "Routine Maintenance".

**C. At 50 Hours:**

1. Change the engine oil and filter.
2. Replace with the specified oil and filters.
3. Change the hydraulic oil filter.
4. Proceed to the oil and filter replacement schedule outlined in Chapter 6 "Routine Maintenance".

**DAILY CHECK LIST**

Efficient and safe operation of the Madvac requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section. A daily check list is provided for the operator. It is important for both personal safety and maintaining the good mechanical condition of the machine that this check list is followed.

Before operating the Madvac and each time thereafter, the following areas should be checked:

1. Check all machine fluid levels: Fuel, coolant, hydraulic oil, engine oil and water level. Refuel or top up fluid levels as required.
2. Inspect all hydraulic lines, hoses and fittings for tightness. Use a clean rag to remove any dirt that has accumulated on any of the fittings.
3. Check the tires and ensure that they are inflated to the specified pressure.
4. Check the trash container. Empty if full.
5. Check the dust filters and clean if required. Empty collector box under the container.
6. Clean engine air intake filter container cover. Clean the air filter if the restriction indicator is in the red.
7. Clean the lights and flashing strobe warning light to ensure that other vehicles can see them.
8. Check all lights and flashers to ensure they are functioning properly.



## STARTING AND STOPPING THE SWEEPER

### Starting The Sweeper

To start the sweeper:

1. Clear the area of bystanders' front and rear, especially small children, before starting.
2. Remove all foreign objects from the machine.
3. Engage the park brake.
4. Ensure that all controls are in the Off position.
5. Check that the direction/speed control lever is in its centered neutral position to engage the neutral start switch. The neutral start switch must be engaged to prevent machine movement when the engine starts. If the machine moves when the engine starts, stop immediately and adjust the neutral start linkage (see Maintenance Section for instructions).
6. Pull the throttle lever to its mid range for starting.
7. Turn the ignition switch to the left (counterclockwise) to activate the glow plugs and hold for 15 seconds to heat the cylinders if the engine is cold.
8. Turn the ignition switch to the Start position to engage the starter.
9. Release the key when the engine starts.
10. Turn the warning flashing light on before starting to operate.
11. Allow the machine to warm up for 2 minutes before moving. When the temperature drops below 5°C (40°F), allow 3 to 5 minutes for the machine to warm up before using.
12. Move the throttle to its maximum speed setting when starting to work.
13. New operators or those who have not operated the unit for some time should always allow time to become familiar with the machine. Select a level, open area free of obstacles and bystanders to try the controls. Practice starting, stopping, backing up and turning. Become familiar with all controls before going to work.



**NOTE:** Always use the speed/direction lever to select ground speed.

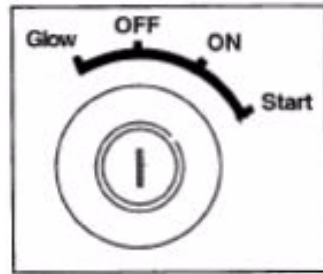


Figure 9. Ignition Switch.

### **Stopping The Sweeper**

To stop the sweeper:

1. Gradually release the speed/direction control lever to its neutral position. The hydrostatic motors on the drive wheels will provide dynamic braking to the unit. When necessary pull up on the brake lever to help stop the machine.
2. Engage the park brake.
3. Turn all control switches to the Off position.
4. Move the throttle lever down until the engine is running at low idle.
5. Turn the key counter-clockwise to shut off the engine.
6. Remove the ignition key before leaving the machine parked.

### **OPERATING THE SWEEPER**

To operate the sweeper:

1. Clear the area of bystanders.
2. Review all items on the Daily Check List.
3. Start the sweeper (refer to the section "Starting the Sweeper" on page OG 3:5).
4. Proceed to the working area.
5. Depress the button on top of brooms to release them to the ground, then turn the brooms on.
6. Push the throttle lever forward and run the engine at 3/4 RPM.
7. Turn on the flashing beacon.

8. Turn the water spray on, if required.
9. Move the machine into position.
10. Gather trash.
11. The machine can develop sufficient vacuum to draw water into the container and pick up the trash in the water. The water passes through the system and the trash remains in the container.
12. The container must always be emptied at the end of the day to prevent rusting.
13. In conditions where the temperature drops below the freezing point, empty the refuse container and remove all the water from the water reservoirs to prevent any damage to the machine's water system.
14. The tight maneuvering ability and easy direction change allows the operator to drive through or around almost any obstacles to gather trash.
15. Never allow riders on any part of the machine.
16. Gather trash until the container is full.
17. When the container fills, the machine will gradually lose suction. When trash can no longer be picked up, the container must be emptied. Refer to the section "Emptying the Container" on page OG 3:8.
18. Always drive at speeds appropriate to the terrain and surroundings. Use slow speeds when going over rough terrain, in congested areas or when people are present.



**WARNING:** Maintain a safe speed when making short corners or going over rough, uneven terrain or when pedestrians are present.

19. When operating on steep inclines go up the slope or down the slope, never across it to prevent rollover.
20. The unit can go over obstacles up to 5 inches high, such as curbs. However, the operator must always approach these at slower speeds.
21. When changing speed or direction:
  - a. Slowly release the pressure on the control lever.
  - b. Use the dynamic braking of the hydrostatic system to slow the machine.
  - c. When the return spring centers the lever, the unit should be stopped. Then depress the other side of the lever to change directions.
22. Use an air nozzle or water hose to flush out the dust filters daily, or as often as necessary to keep them clean.

## GATHERING TRASH:

The machine can easily pick up trash and debris of all types. Virtually any debris that can fit the inlet hose will be picked up.



**NOTE:** The operator need not be concerned about the type of material collected as no litter passes through the fan.

## Sweeping

Before starting to sweep:

1. Lower the brushes to the ground by depressing the top of the release button.
2. Turn the brush control switch to the On position.
3. Pull the throttle control about half the engine RPM.
4. Turn the water spray on by depressing the water spray switch.
5. You are now ready to start sweeping.



**WARNING:** Maintain a safe speed when turning sharp corners or going over rough, uneven terrain or when pedestrians are present.

## EMPTYING THE CONTAINER

As the container fills, the debris covering the bottom and sides of the container will block the flow of air and causing the vacuum to loose suction. To restore suction, the container should be emptied.



**NOTE:** If your PS300 is equipped with the high side dump option, refer to Chapter 4 for operating instructions.

To empty the container:

1. Slow and stop the machine. Place all controls in the Off position. Engage the park brake.
2. Shut off the engine.
3. Keep hazard flasher On.
4. Raise the container cover to its highest position.

5. Pull the collector bag out of the container and empty into a poly bag (or discard as instructed by your supervisor).
6. Shake the filters to loosen dust to the bottom drawer if necessary.
7. Replace the collector bag in the container.
8. Close the container access cover.



**NOTE:** When operating in very dusty conditions, remove and empty the dust tray under the container.

You can now continue sweeping.



### Transport Safety



- Read and understand all the information in the Operator's Manual regarding procedures and safety when operating the Madvac in the workplace and/or on the road.
- Always travel at a safe speed. Use caution when turning corners or meeting traffic.
- Make sure the SMV (Slow Moving Vehicle) emblem is in place as well as all lights and reflectors required by local highway and transport authorities. These should be clean and visible to all overtaking and oncoming traffic.
- Do not allow riders on any part of the machine during either field operation or road and highway travel.
- Always use hazard warning flashers and the rotating beacon on the Madvac when transporting unless prohibited by law.

## TRANSPORTING THE SWEEPER

To move the sweeper:

1. Clear the area of bystanders.
2. Clean all lights and reflectors.
3. Start the machine (see page OG 3:5).
4. Turn hazard flasher beacon on.



**CAUTION:** Exercise caution when transporting the sweeper during times of limited visibility. Be sure that you can be seen by oncoming and overtaking traffic.



**CAUTION:** Never exceed the speed appropriate for the terrain and conditions. Slow down for turns and when traveling over rough terrain.

## **TOWING THE SWEEPER**

Hydrostatic powered vehicles use fluid to power their drive wheels at all times. As a result, they cannot be towed unless this fluid power is bypassed. The Madvac features a dump valve on top of the pump that allows the motor drive circuit oil to be bypassed.

Open the valve (1) by turning it counterclockwise when it is necessary to tow the vehicle. Turn the valve clockwise to restore normal hydrostatic drive. This valve is built into the hydrostatic pump.

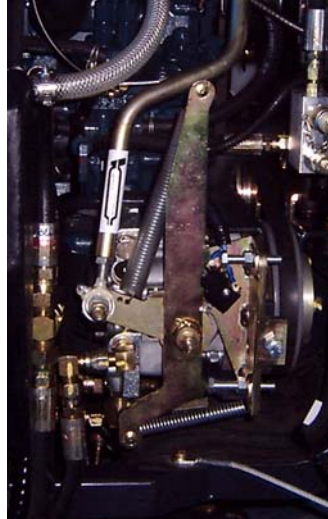


Figure 10. Tow Valve.

## **STORING THE SWEEPER**

There are procedures to follow when putting the sweeper in storage and when removing it from storage.

### **Putting The Sweeper In Storage:**

After the seasons use, inspect all the major systems and components of the machine. Repair or replace all damaged or worn parts at this time to prevent any unnecessary delays at the start of next season.

1. Service and lubricate the machine as per the schedule provided in the Maintenance Section.
2. Inspect the engine compartment and container. Remove any trash or debris from those areas.
3. Open the container and tilt it back.
4. Remove the dust tray.
5. Wash the machine, container and dust screen thoroughly with a hose or pressure washer. Be sure to remove all mud, trash and debris to prevent rusting of the underlying parts.

6. Allow the container to drain.
7. Place the container in its operating position and run the fan for 3 to 5 minutes to dry the system.
8. Install and secure the dust pan.
9. Check the condition of all hydraulic lines, hoses and fittings. Replace any damaged or worn components. Be sure to fix all leaks.
10. Touch up all paint chips and nicks to prevent rusting. Use a rust preventative paint. This paint is available by the can or in a spray bomb.
11. Remove the battery and store it in a cool, dry area on wooden blocks or a wooden pallet. Charge the battery monthly to maintain an adequate charge.
12. Check engine coolant concentration. If too low, the water could freeze and damage the engine. Empty all water tanks and drain water lines to prevent freezing.
13. Store the machine inside a building to protect it from the elements. If it cannot be stored inside a building, cover it with a waterproof tarpaulin and tie the tarpaulin down securely.
14. Store the machine away from areas of human activity.
15. Block the wheels if the machine is stored over a long period of time.

### **Removing The Sweeper From Storage**

To remove the sweeper from storage:

1. Remove the tarpaulin.
2. Charge the battery to the specified level, then install it.
3. Review all items on the Daily Check List.
4. Check all fluid levels and top up as required.



## CHAPTER 4

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### Optional Equipment

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- with Manual Guillotine Operation	OG4 :2
- with Hydraulic Guillotine Operation	OG4 :2
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Using the Dog Excrement Aspirator	OG4 :4
Using the Fold and Stow Seat	OG4 :5

## OPTIONAL EQUIPMENT

### USING THE WANDERHOSE

The wanderhose is designed to help clean areas that are not easily reached with the sweeper, such as around trees and between cars. There are two modes of operation for the wanderhose guillotine: manual and hydraulic.

#### Manual Guillotine Operation

1. Pull the wanderhose lever located under the right cover. This action will divert the vacuum from the main hose to the wanderhose.



2. Push down on the wanderhose handle to release it from its storage position.
3. Pull the wanderhose up.
4. Gather trash.

To resume sweeping operations, put the wanderhose back in its storage position and then pull the wanderhose lever.

#### Hydraulic Guillotine Operation

1. Press the Brushes switch ("b" in Figure 6 on page OG 2:3) to stop the brushes. This action will also divert the vacuum from the main hose to the wanderhose.
2. Push down on the wanderhose handle to release it from its storage position.
3. Pull the wanderhose up.
4. Gather trash.

To resume sweeping operations, put the wanderhose back in its storage position and then press the Brushes switch to start the brushes.

## USING THE HIGH SIDE DUMP

To use the High Side Dump option:

1. Put the throttle to the lowest RPM.
2. Open the hood to access the trash basket.
3. Put the backing plate in front of the exhaust vent.
4. Press the High Side Dump switch ("a" in Figure 6 on page OG 2:3) to raise the basket.
5. Put a garbage bag over the rim of the basket, then tip the basket towards yourself while holding the bag in place.
6. Place the basket back in the upright position.
7. Press the High Side Dump switch to lower the basket.
8. Remove the backing plate from the exhaust vent.
9. Close the hood.



**NOTE:** Ensure that the hood is securely latched to provide a good seal. A poor seal will adversely affect the suction of the PS300.

## USING THE DOG EXCREMENT ASPIRATOR

The Dog Excrement Aspirator (DEA) option is designed to pick up dog excrement and deposit it into a disposable plastic bag. This bag is held in a separate DEA container which prevents the excrement from becoming mixed with the debris in the main container and causing unpleasant odors.

To use the Dog Excrement Aspirator option:

1. Open the DEA container cover.
2. Insert a plastic bag into the DEA container.



**NOTE:** The bag must overlap the container by approximately 1 inch all the way around the rim of the container.

3. Close the cover, then latch it.
4. Ensure that the wanderhose is in its storage position.
5. Divert the vacuum from the main hose to the DEA vacuum tube using the guillotine (manually or hydraulically, depending on the configuration of your machine).

To manually divert the vacuum, pull the lever located under the right cover.

To divert the vacuum hydraulically, press the Brushes switch ("b" in Figure 6 on page OG 2:3) to stop the brushes.

6. Use the DEA vacuum tube to pick up the excrement.
7. To use water spray, activate the water spray switch on the dash.



**NOTE:** To use a disinfectant spray solution, the water tank must be filled with the appropriate mixture of water and solution according to the suppliers' recommendations.

To resume sweeping operations, divert the vacuum to the main hose using the guillotine (manually or hydraulically, depending on the configuration of your machine). To divert the vacuum manually, pull the lever located under the right cover. To hydraulically divert the vacuum, press the Brushes switch to start the brushes.

### USING THE FOLD AND STOW SEAT

The Fold and Stow Seat provides the operator with the option of riding the sweeper. Procedures for unfolding and for stowing the seat are provided below.



**WARNING:** Before starting either of these procedures, park the machine on a clean level surface, stop the engine, place all controls in the Off position, set the parking brake, remove the ignition key and wait for all moving parts to come to a complete stop.

To unfold the seat:

1. Push on the upper hook latch with your finger.



2. Push on the spring blade towards the machine and push the hook towards the right side.



3. Lift up the assembly towards the machine.
4. Lift up the spring underneath the base.



5. Fold the seat assembly by pressing the spring blade down and follow through towards the machine.
6. Lift up the compensation bar towards the machine.



7. Pull up on the compensation bar latch and pull the blade forward to release the hook.



8. Let the seat slide down along the spring blade.
9. Fold the license plate and pull up on the seat latch.
10. Unfold the seat.



To stow the seat:

1. Fold the seat.



2. Fold the license plate and pull up on the seat latch.





3. Let the seat slide down along the spring blade.



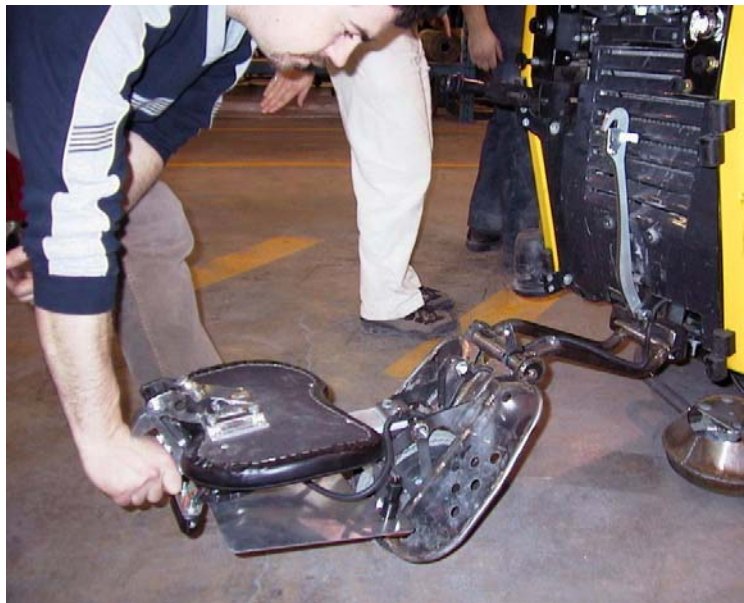
4. Pull up on the compensation bar latch and pull the blade forward to release the hook.



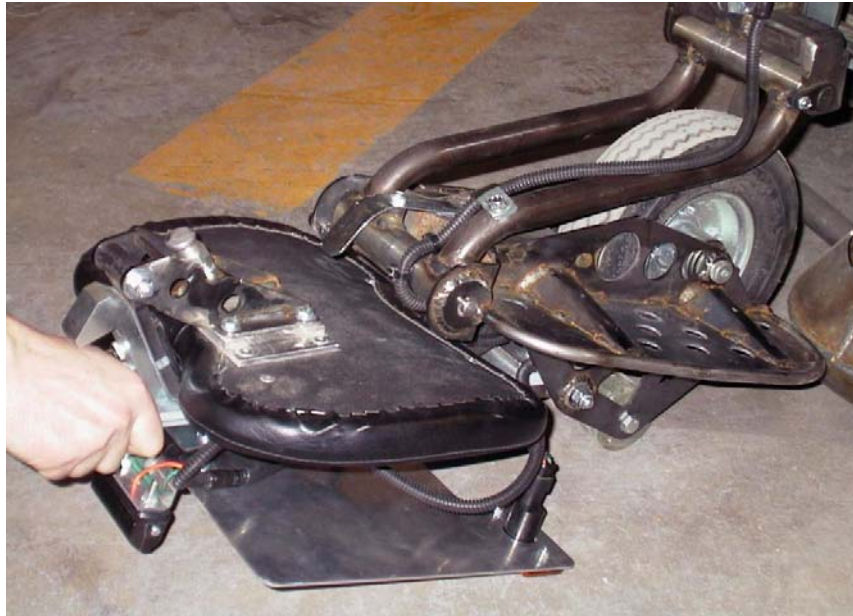
5. Lift up the compensation bar towards the machine.



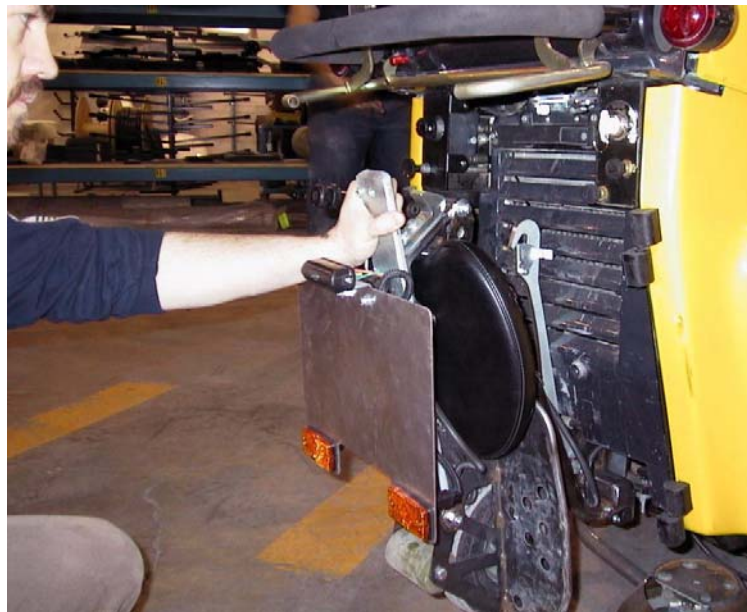
6. Fold the seat assembly by pressing the spring blade down and follow through towards the machine.



7. Lock the spring underneath the base.



8. Lift up the assembly towards the machine.





9. Lock into secure position.





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# CHAPTER **6**

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## **Routine Maintenance**

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### Maintenance Safety



- Review the Operator's Manual and all safety items before working with, maintaining or operating the Madvac PS 300.
- Place all controls in neutral, stop engine, set park brake, remove ignition key, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Follow good shop practices: Keep service areas clean and dry. Be sure electrical outlets and tools are properly grounded. Use adequate light for the job at hand.
- Before applying pressure to hydraulic system make sure that all connections are tight and that all hoses and fittings are in good condition.
- Keep hands, feet, clothing and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments or emptying.
- Do not attempt any adjustment or maintenance to any system of the Vacuum when the machine is in motion.
- Make sure that all guards and shields are properly installed and secured before operating the Vacuum.
- Securely support the container using the lift cylinders safety stoppers before working beneath it or attempting any adjustment or maintenance to any part with the container in the raised position.
- Securely support the machine using blocks or safety stands before working beneath it or changing tires.
- Store and transfer fuel, solvents, cleaners or any flammable liquids only in safety standard approved containers.



## BOLT TORQUE

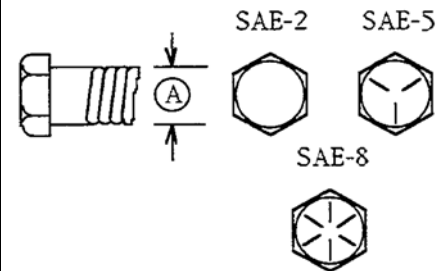
### Checking Bolt Torque

The tables below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in the appropriate table unless otherwise noted. Check tightness of bolts periodically, using the appropriate bolt torque table as a guide. Replace hardware with the same strength bolt.

### English or Imperial Torque Specifications

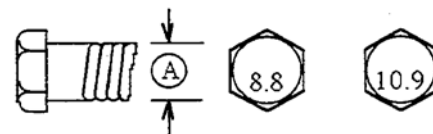
Bolt Diameter	SAE 2		Bolt Torque* SAE 5		SAE 8	
"A"	(N•m)	(lb-ft)	(N•m)	(lb-ft)	(N•m)	(lb-ft)
1/4"	8	6	12	9	17	12
5/16"	13	10	25	19	36	27
3/8"	27	20	45	33	63	45
7/16"	41	30	72	53	100	75
1/2"	61	45	110	80	155	115
9/16"	95	60	155	115	220	165
5/8"	128	95	215	160	305	220
3/4"	225	165	390	290	540	400
7/8"	230	170	570	420	880	650
1"	345	225	850	630	1320	970

\* Torque value for bolts and capscrews are identified by their head markings.



### Metric Torque Specifications

Bolt Diameter "A"	Bolt Torque			
	8.8		10.9	
	(N•m)	(lb-ft)	(N•m)	(lb-ft)
M3	.5	.4	1.8	1.3
M4	3	2.2	4.5	3.3
M5	6	4	9	7
M6	10	7	15	11
M8	25	18	35	26
M10	50	37	70	52
M12	90	66	125	92
M14	140	103	200	148
M16	225	166	310	229
M20	435	321	610	450
M24	750	553	1050	774
M30	1495	1103	2100	1550
M36	2600	1917	3675	2710



Rear wheel motors should be torqued at 300 to 400 ft. lbs. to hub.

Torque figures indicated in these tables are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. Increase torque values by 5% when using locking elements.

**Tightening O-Ring Fittings \***

1. Inspect O-ring and seat for dirt or obvious defects.
  2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.
  3. Hand tighten fitting until back-up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
  4. Position angle fittings by unscrewing no more than one turn.
  5. Tighten straight fittings to torque shown.
  6. Tighten while holding body of fitting with a wrench.
- \* The torque values shown are based on lubricated connections as in reassembly.

Thread Size (in.)	Size Across Flats (in.)	Torque Value*		Recommended Turns to Tighten (After Finger Tightening)	
		(N•m)	(lb-ft)	(Flats)	(Turn)
3/8	1/2	8	6	2	1/3
7/16	9/16	12	9	2	1/3
1/2	5/8	16	12	2	1/3
9/16	11/16	24	18	2	1/3
3/4	7/8	46	34	2	1/3
7/8	1	62	46	1-1/2	1/4
1-1/16	1-1/4	102	75	1	1/6
1-3/16	1-3/8	122	90	1	1/6
1-5/16	1-1/2	142	105	3/4	1/8
1-5/8	1-7/8	190	140	3/4	1/8
1-7/8	2-1/8	217	160	1/2	1/12

**Tightening Flair Type Tube Settings \***

1. Check flare and flare seat for defects that may cause leakage.
  2. Align tube with fitting before tightening.
  3. Lubricate connection and hand tighten swivel nut until snug.
  4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second wrench tighten the swivel nut to the torque shown.
- \* The torque values shown are based on lubricated connections as in reassembly.

Tube Size OD (in.)	Nut Size Across Flats (in.)	Torque Value*		Recommended Turns to Tighten (After Finger Tightening)	
		(N•m)	(lb-ft)	(Flats)	(Turn)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

## RECOMMENDATIONS

### Fluids and Lubricants

1. **Grease:** Use SAE multi-purpose high temperature grease or multi-purpose lithium base grease.
2. **Diesel Fuel:** Use Grade No. 2 fuel, as defined by ASTM Designation D975 for Diesel fuels. When operating in cold ambient temperatures, the use of a mixture of No. 1 and No. 2 is permitted for a short period of time.

#### Fuel Specifications:

Sulfur Content: Less than 1% by weight, preferably less than 0.5%.

Cloud Point: At least 10°F below lowest expected ambient temperature.

Water and Sediment: Less than 0.1% by weight

Cetane Number: 40 minimum. In cold weather or high altitudes, 45 to 55 is desirable.

Viscosity: Over 1.3 centistrokes at all times to provide adequate lubrication to the fuel system.

Fuel Tank Capacity: 16 U.S. gal (60 liters)

3. **Hydraulic Fluid:** Use an ISO 36 grade oil in the hydraulic oil reservoir for most working conditions. Use lighter grade oil for lower temperatures.

Tank Capacity: 16 gal (60 liters).

4. **Coolant:** It is suggested to use a 50:50 mixture of good or brand name commercial grade ethylene-glycol base antifreeze, which meets the chemical composition of GM 6038-M. This mixture should be used down to an ambient temperature of -37°C (-34°F). Use 60:40 mixture for temperatures down to -54°C (-65°F). Do not use oil base or alcohol base antifreezes.

Coolant Capacity: 1.0 gal (4.0 liters).

5. **Engine Oil:** Use a SAE 10W30 multi-viscosity oil meeting the American Petroleum Institute (API) Classification of CC/CD/CE for most operating conditions. Consult engine manual for unusual operating temperature. Do not mix oil types or viscosity.

Crankcase Capacity: 1.6 US gallons (6.0 liters).

6. **Storing Lubricants and Fluids:** Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all fluids. Store them in an area protected from dust, moisture and other contaminants.

## **GREASING**

Refer to the chart on page OG 6:22 for recommended grease. Use the Service Interval checklist provided on page OG 6:8 to keep a record of all scheduled maintenance.

1. Use only a hand-held grease gun for all greasing. An air-powered greasing system can damage the seals on bearings and lead to early failures.
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passage. Replace fitting if necessary.

## **SERVICE INTERVALS**

### **Daily or 8 Hours**

1. Check engine oil level.
2. Check coolant level.
3. Check fuel level. Add as required.
4. Clean the engine air filter canister cover. Check air restriction indicator. Blow out filter only if indicator is in the red (refer to page OG 6:11).
5. Clean the vacuum exhaust filter.
6. Clean and empty dust tray.



**WARNING:** MACHINE IS SHOWN WITH ENGINE COMPARTMENT DOOR OPEN FOR ILLUSTRATIVE PURPOSES ONLY. NEVER OPERATE WITH DOOR OPEN.

### **Weekly**

1. Grease brush support arm pivot points (2 locations each side).
2. Grease front wheels swing arm pivot point.
3. Check oil level in hydraulic reservoir. The oil line should be seen between the two lines on the dipstick located inside the oil filler cap. Do not overfill.
4. Check engine air filter. Clean or replace as required (refer to page OG 6:11).
5. Check fan and pump drive belts for tightness.



6. Clean fuel filter.

### **100 Hours**

1. Change engine oil. (Refer to Engine manual).
2. Change engine oil filter. (Refer to Engine manual).

### **250 Hours**

1. Change fuel filter element. (Refer to Engine manual).
2. Change hydraulic oil filter cartridge (refer to page OG 6:9).
3. Clean engine and compartment.

### **500 Hours or Annually**

1. Change oil in hydraulic system.
2. Remove and clean hydraulic suction strainer.

## PS-300 Service Intervals

See Lubrication and Maintenance section for details of service. Copy this page and record all service done to the machine.

**Action Code:**      L = Lubricate      C = Change      CL = Clean  
                              ✓ = Checked      RE = Remove      X = Not Checked

<div>Hours:</div> <div>Served By</div>													
<b>Maintenance</b>													
<b>8 Hours Or Daily</b>													
✓	Engine Oil Level												
✓	Coolant Level												
✓	Fuel Level												
✓	Water Level												
CL	Vacuum Filter Panels												
CL	Container Dust Tray												
<b>50 Hours Or Weekly</b>													
✓	Oil Level in Hydraulic Reservoir												
✓	Engine Air Filter												
L	Swing Arm Pivot Point												
L	Brush Support arm pivot Points (4)												
CL	Engine Air Filter Canister												
CL	Engine And Compartment												
<b>2 Weeks Or 100 Hours</b>													
✓	Engine Drive Belts												
C	Fuel Filter												
C	Engine Oil												
CL	Engine And Compartment												
CL	Air Filter elements												
<b>Monthly Or 250 Hours</b>													
C	Return Filter on Hydraulic System												
C	Engine Oil Filter												
<b>500 Hours</b>													
C	Oil in Hydraulic System												
RE & C	Hydraulic Suction Strainer												

## MAINTENANCE

### Engine Oil and Filter Changing

1. Review the Operator's Manual for the engine.
2. Allow the engine to cool before changing oil. Hot oil can cause burns if it contacts exposed skin.
3. Be sure the ignition key is removed.
4. Place a pan under the drain plug.
5. Remove the drain plug (see Figure 11) and allow oil to drain for 10 minutes.

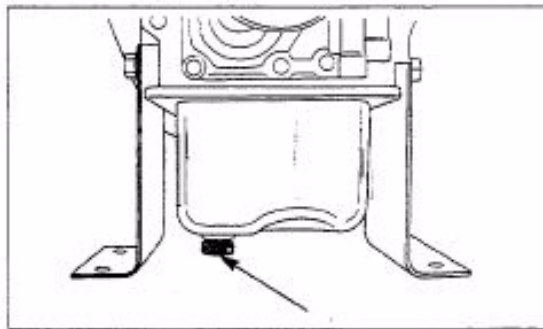


Figure 11. Engine Oil Drain Plug

6. Use a band filter removal tool to remove the engine oil filter (see Figure 12).

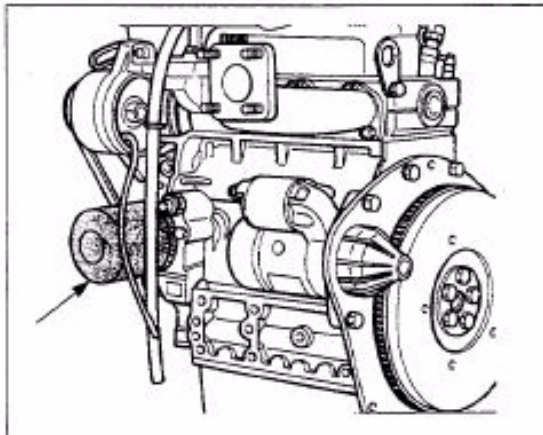


Figure 12. Engine Oil Filter

7. Coat the oil filter gasket with oil before installing.
8. Tighten by hand until the filter is snug. Then tighten an additional 1/2 turn to seal. Do not over tighten.
9. Install the engine drain plug (see Figure 11).
10. Dispose of the oil in an approved container.

11. Add 6 liters (6 quarts US) of SAE 10W30 or 10W40 motor oil (see Figure 13).

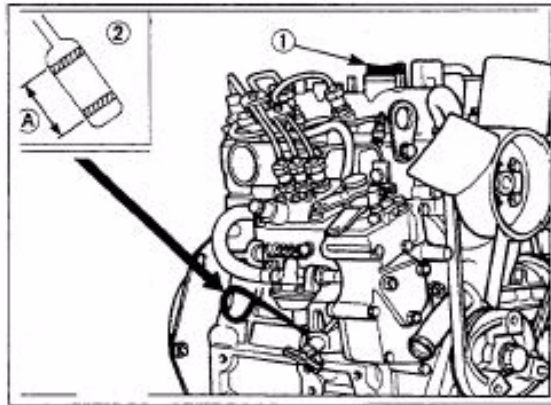


Figure 13. Engine Fill Cap

12. Run the engine for one minute, then check for leaks.
13. If leaks are found around the filter, tighten slightly and repeat Step 12.
14. Check engine oil level. Top up as required.

### Fuel Filter

The inline fuel filter located between the tank and the engine should be changed every 250 hours or more frequently if required. Be sure the machine has cooled before servicing.

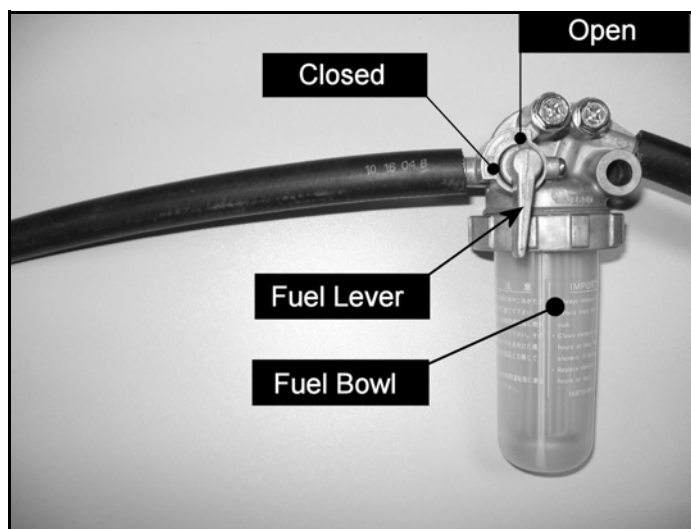


Figure 14. Engine Fuel Filter

1. Move the Fuel Filter Lever to the Closed position



2. Unscrew the Screw Ring and remove the filter bowl and rinse the inside with diesel fuel.
3. Take out the element and rinse it with diesel fuel.
4. After cleaning, reinstall the fuel filter keeping out dust and dirt.
5. Open the fuel filter lever.

Refer to engine manual for more detail.

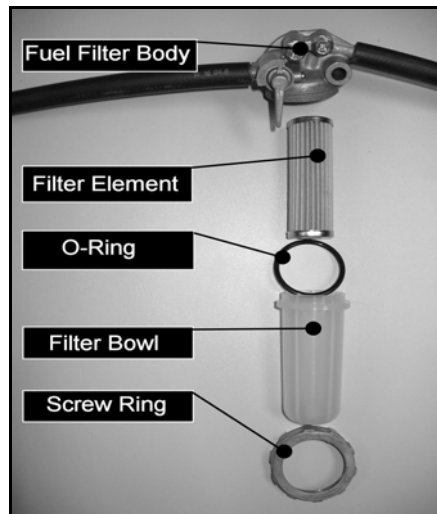


Figure 15. Changing Engine Fuel Filter

### Air Cleaner Maintenance

The air intake system consists of a canister with an engine filter element inside. Cleaning of this element should only be done when the element is dirty and the air restriction indicator is in the red to prevent damage to the filter or seals. When the inner element gets dirty, replace it.

To clean the air cleaner:

1. Clear the area of bystanders.
2. Place all controls in neutral, stop the engine, set park brake, remove the ignition key and wait for all moving parts to stop before dismounting.
3. On a daily basis before starting, open the canister cover and remove any dirt in the cover. Clean the element only when the air restriction indicator is in the red.

4. To clean, remove the cover on the canister (see Figure 16).



Figure 16. Air Filter Canister

5. Remove the wing nut holding the filter in place.
6. Carefully slide the filter out of the canister.
7. Apply compressed air into the body from the inside with at least one-inch clearance between the filter element and the air nozzle. Do not exceed 100 psi (7 kg/cm<sup>2</sup>) air pressure.
8. If the element is heavily caked with dirt, submerge in an element cleaning solution for 30 minutes. Rinse with clean water and allow to dry for 24 hours.
9. Place a light source inside the element and check for pinhole leaks.
10. If the element or seals are damaged or the paper has a pinhole leak, replace the filter.
11. Clean the inside of the canister.
12. Check all the air intake system connections. Tighten any loose connections.
13. Install the filter in the canister. Be sure the seals are seated.
14. Close and secure the canister cover.
15. Reset the restriction indicator.

### **Cleaning Engine and Compartment**

Dirt, dust and trash can build up in the engine compartment. Use a high-pressure air hose to keep the engine and compartment clean. Clean the air intake louvers as required insuring that a free flow of outside air is maintained to the engine. Blow out the compartment monthly or more often if operating in very dirty conditions.

If the unit runs hot or overheats, use a pressure washer to clean the radiator, oil cooler and specifically the space between the cooler and the radiator. This will provide unrestricted airflow and will lower the engine temperature.

A clean engine runs better, stays cool and eliminates the chance of fire.



Figure 17. Engine Compartment

### Hydraulic Oil Filter Changing

There are three (3) hydraulic circuits on the machine. A variable displacement piston pump is bolted to the output end of the engine and provides fluid power to the motors on the rear wheels of the unit. A pressure compensated variable displacement piston pump is attached to the hydrostatic pump. It provides power to the arm and the container hydraulic systems. Schematics are shown in the Parts Section.

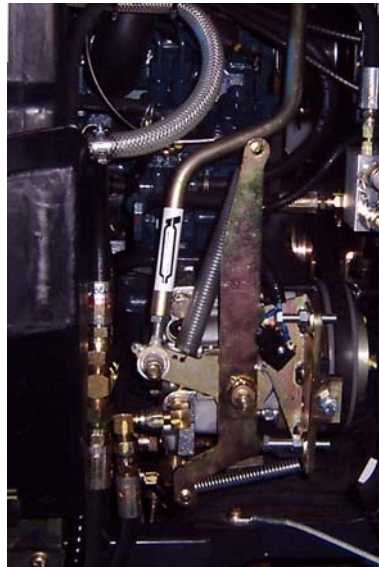


Figure 18. Hydraulic Pumps

The suction strainers filter the oil before it goes to the piston pumps. All oil is routed through the return filter.

The return filter should be changed every 250 hours. To change filters, follow this procedure:

1. Open the engine compartment door.
2. Allow oil to cool off before changing filter. Hot oil can cause burns.
3. Place a collector pan below the filter to catch any spilled oil.
4. Use a banded filter removal tool to loosen and remove the filter.
5. Dip your finger in oil and wet the rubber seal on the top of the new filter to aid in sealing.
6. Install the replacement filter.
7. Hand tighten until the filter is seated. Then tighten the canister another 1/2 turn using a banded filter tool. Do not over tighten.
8. Start the engine and check for leaks. Stop the engine and tighten the filter slightly if there are any leaks.
9. Check the oil level in the reservoir and top up as required.

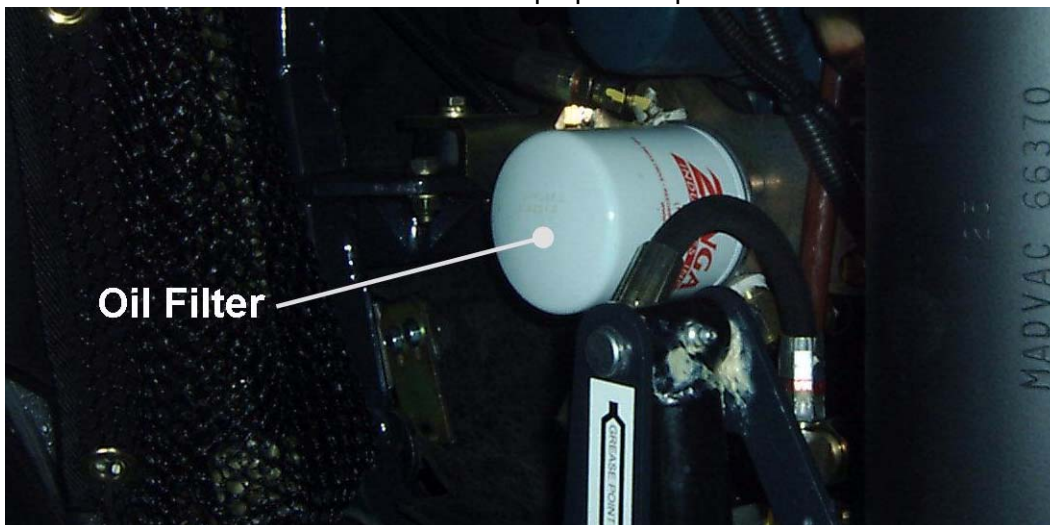


Figure 19. Hydraulic Oil Filter

### Changing Hydraulic Oil

The oil in the hydraulic system should be changed every 500 operating hours or every 2 years, whichever comes first.

To change the hydraulic oil:

1. Stop the engine and allow the system to cool.
2. Place a container under the drain plug. More than one container may be required because the tank holds 60 liters (16 US gallons).
3. Remove the drain plug and allow the system to drain for 10 minutes.
4. Replace the hydraulic filters (refer to page OG 6:13).

5. Remove, clean and replace hydraulic suction strainers.
6. Install the drain plug using Teflon tape or pipe sealant compound and fill the reservoir with ISO 36 hydraulic oil. System capacity approximately: 50 liters (16 US gallons). Fill to oil level indicator. Do not overfill.

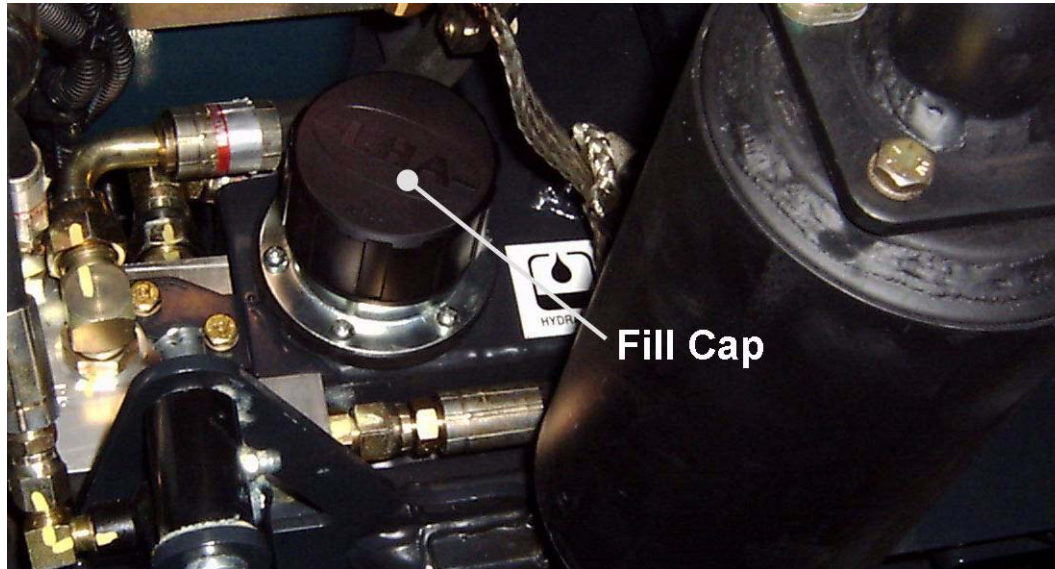


Figure 20. Hydraulic System

7. Start the engine and run for 3 minutes. Operate all systems to purge the lines of air and to check for leaks.
8. Check the oil level in the reservoir and top up as required.

### Control Cable Lubrication

The control cables should be lubricated every 100 hours using WD40, a light oil or similar lubricant.

Put a couple of drops of light oil or a couple of short bursts of WD40 into the end of the cable sheath to lubricate the cable. This is particularly important in wet, cold conditions to minimize the possibility of freezing.



### **Cleaning Dust Screen**

All exhaust air is routed through a filter and screen in the rear wall of the engine compartment. After prolonged use, the filter can fill with dirt and restrict the airflow through the system.

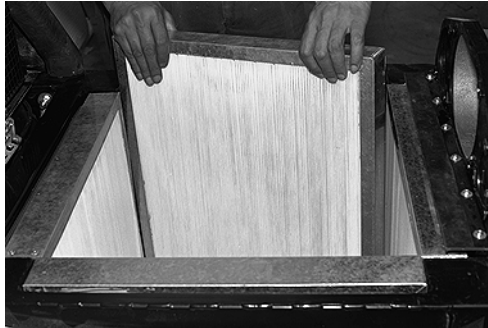


Figure 21. Cleaning the Panel Filters

It is recommended that the filter be washed weekly or more often if required. To clean the filter, follow this procedure:

1. Place all controls in the OFF position, stop engine, set park brake, remove ignition key and wait for all moving parts to stop.
2. Open engine compartment doors.
3. Remove dust tray from the bottom of the screen to allow the water to escape.
4. Use air to blow out most of the dust, then use a water hose or pressure washer to wash the dust filter.
5. Open the screen frame and wash the inside of the housing and the baffle.
6. Clean and wash the fan and the fan casing.
7. Allow the system to drain.
8. Start the machine and run the fan for several minutes to dry the system.

9. Install and secure the dust tray.



Figure 22. Dust Tray Cleaning

### EQUIPMENT ADJUSTMENT

#### Vacuum Nozzle

The vacuum inlet nozzle height is adjustable. The distance between the nozzle and the ground has an influence on the amount of vacuum obtained for a given task.



Figure 23. Vacuum Nozzle Height

The clearance can be larger when collecting larger debris and there is no effort required for finer dust and sand. When sweeping in areas where sand and fine dust is a concern, the nozzle should be closest to the ground. To adjust the nozzle height, follow this procedure:

1. Park the machine on a clean level surface.

2. Place all controls in the Off position and set the parking brake.
3. Turn the adjusting knob on top of the nozzle counter-clockwise until the nozzle rests on the ground.
4. Turn the adjusting knob clockwise one (1) turn. Check ground clearance, the nozzle should be between 1/4 and 1 inch from the ground, this should give the proper height for most sweeping conditions. If needed the nozzle can be further adjusted up or down as required.



**NOTE:** Consider manhole covers and irregular terrain when adjusting nozzle height.

### Brushes

The amount of pressure on the brushes greatly affects their performance and their wear:

1. Park the machine on a clean level surface.
2. Place all controls in the OFF position, turn OFF the engine and set the parking brake.
3. Press on the release plate and lower both brooms on the ground. Check for signs of wear and replace if necessary.
4. The brooms should only be in light contact with the ground. Turn the adjusting knob on top of the brush arm counter-clockwise to lower and clockwise to raise.



Figure 24. Adjusting Brushes



## Brakes

Two standard automotive type disk brakes are used on this machine for parking brakes. Adjust the brake using the regular automotive brake adjustment procedure.

## Neutral Start Switch

The machine is equipped with a neutral start switch that prevents the engine from starting unless the speed/direction control pedal is in its neutral position. If the machine should start and move without touching the pedal, stop the unit and adjust the linkage.

To adjust the neutral start switch linkage, follow this procedure:

1. Stop the engine, place all controls in the OFF position, set the park brake, remove ignition key and wait for all moving parts to stop.



**WARNING:** Always maintain the neutral start switch such that the hydrostatic drive will not move the machine when starting the engine.

2. Place blocks in front and behind front wheels to prevent vehicle from moving.
3. Lift both drive wheels off the ground by jacking under wheel motors.
4. Place safety stands under frame.
5. Open the left engine door.
6. Loosen the locking nut (1) on pump control bracket.
7. Start engine and keep clear of all moving parts. Turn the bracket (2) until the hydrostatic pump is in neutral while the cam roller (3) seats in the lowest part of the cam plate (4) and rear wheels stop turning.
8. Stop engine.
9. Tighten bolt on bracket.
10. If necessary loosen and readjust screw that rests on neutral start micro-switch and ensure contact is made when roller rests in the lowest part of the cam plate.
11. Close engine door.



**WARNING:** Ensure all safety precautions are taken while adjusting the neutral start switch. The machine may move. Only qualified and experienced mechanics should perform this operation.

12. Remove safety stands and lower rear wheels to the ground.

13. Start engine. It should now start only when the traction lever is in its centered position and the unit is in neutral.

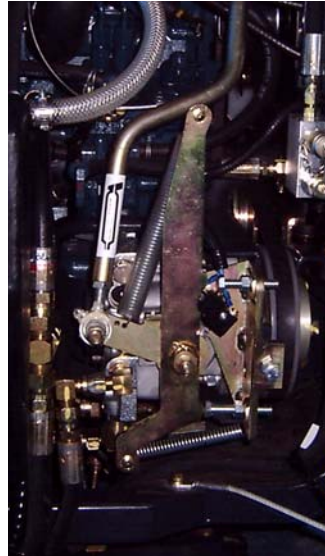


Figure 25. Neutral start adjustment

### **Traction Lever**

The traction lever on this machine has been ergonomically designed to limit operator fatigue. The angle on the traction bar can be adjusted to maintain operator comfort. To adjust the traction lever angle, follow this procedure:

1. Stop the engine, place all controls in the OFF position, set the parking brake, remove ignition key and wait for all moving parts to stop.
2. Open the right side engine door.
3. Remove the bolt on the connecting rod (1).
4. Screw in the rod end to increase height on the lever. Unscrew the rod end to lower the traction lever. The top of the lever should be flush with the top of the control bar.

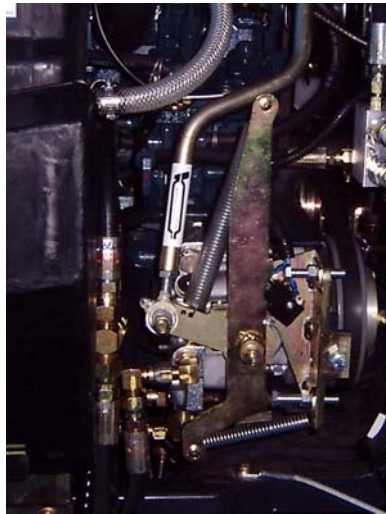


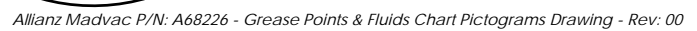
Figure 26. Traction Lever Adjustment.

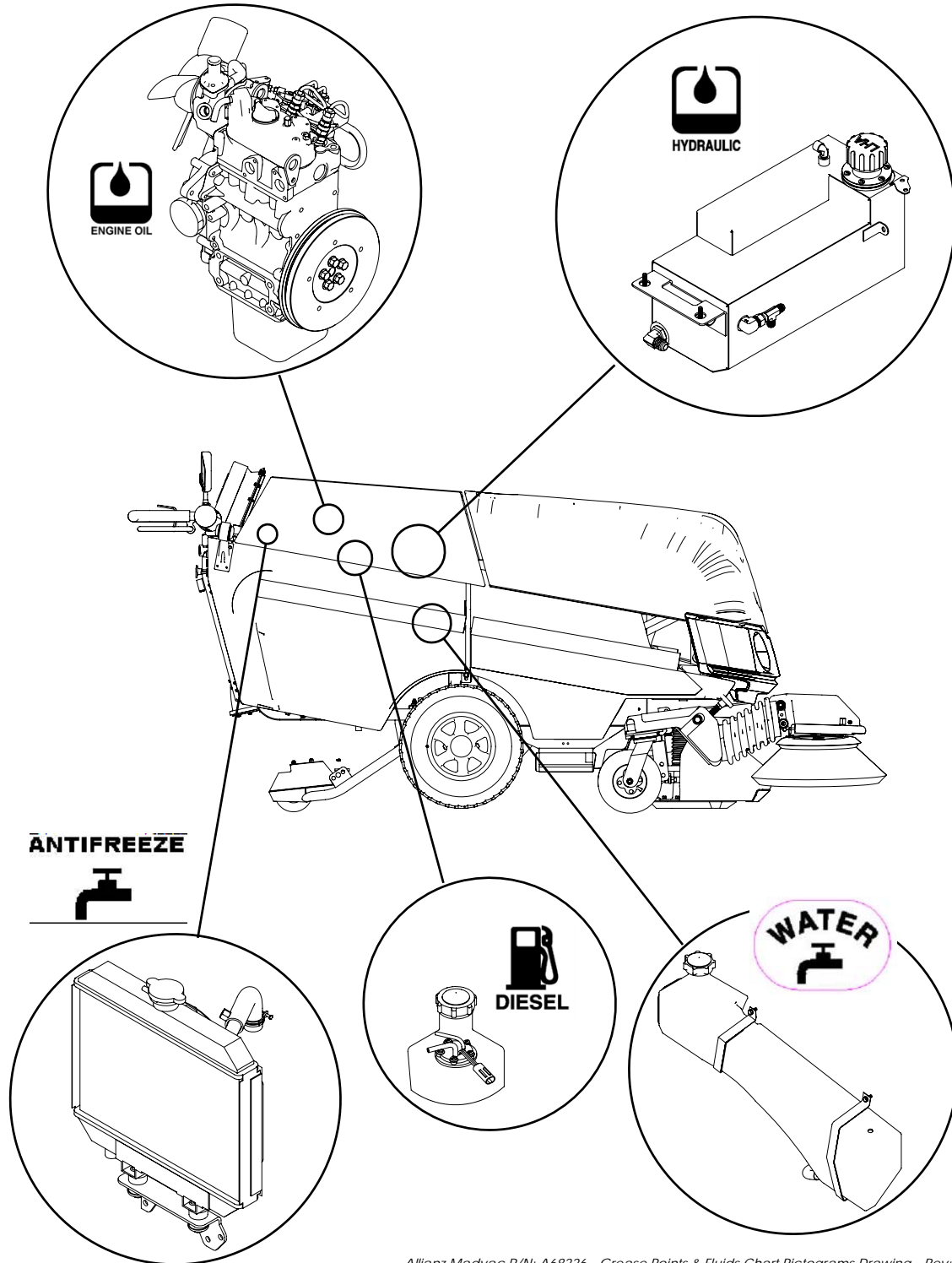
## ENGINE SPEED SETTINGS

Idle	1200 RPM
High speed	3100 RPM

Model: PS300	Capacity	Spec.	Allianz Madvac OEM Part Number	Equivalent (Local Suppliers)					
				Shell	BP	Castrol	Mobil	Esso	Gulf
Engine Oil	1.6 US gal. (6.0 liters)	S.A.E. 15W/40	R1034 (sold by the liter)	Rimular Super 15W/40	Vanellus C3 Extra 15W/40	Turbomax 15W/40	Delvac XHP or HP 15W/40	Essolube XT301	Superfleet 200
Engine Coolant (Antifreeze)	0.74 US gal. (2.8 liters)	60% - 40% RED Color	R1000 (sold by the liter)	Shell Safe Premium	BP Isocool	Castrol AF	N/A	N/A	N/A
Hydraulic Oil	3 US gal. (12 liters)	ISO 46	R1033 (sold by the liter)	ISO 46	ISO 46	ISO 46	ISO 46	ISO 46	ISO 46
Grease A (Lithium Base Grease)	As Required	High Temp Lithium Based	N/A	Retinax A	Energolux	LM Grease	Mobilube L2	Beacon 2 Grease MP	N/A
Freon (Optional)	N/A	N/A		N/A					
Windshield Washer (Optional)	N/A	N/A		N/A					
Fuel (Diesel Only)	2.6 US gal (10 liters)	ASTM D975 Grade 2	N/A	Grade 2 Fuel (Equivalent)					
Battery Terminal	As Required	Dielectric Grease		PETROLEUM JELLY					

Allianz Madvac P/N: A68226 - Grease Points &amp; Fluids Chart Pictograms Drawing - Rev: 00





Allianz Madvac P/N: A68226 - Grease Points & Fluids Chart Pictograms Drawing - Rev: 00

## TROUBLESHOOTING

The Madvac PS 300 uses a hydraulically powered fan to evacuate the air from the trash container. A fabric bag in the container collects the trash as it is drawn into the intake tube, providing a simple and effective method to gather trash that requires minimum maintenance.

Many of the problems you may encounter are listed in the following table, along with possible causes and suggested solutions to these problems.

If you encounter a problem that you cannot solve, please contact your authorized Madvac dealer or the Madvac factory. Before you call, please have this Operator's Manual and the serial number from your machine ready.

PROBLEM	CAUSE	SOLUTION
Engine won't start.	Starter won't engage.	Check neutral start switch. Adjust or replace as required.
		Charge battery.
		Check red emergency stop button.
		Check battery terminals. Clean as required.
		Check all electrical connections. Clean or replace as required.
		Check starter. Replace as required.
Machine won't move	Starter engages.	Check relay beside fuse box. Replace as required.
		Check fuel. Add as required.
		Engage glow plug for 20 seconds if engine is cold.
	Low oil.	Check oil level. Add as required.
		Check suction strainer. Clean if plugged.
Linkage disconnected.	Linkage disconnected.	Close hydrostatic dump valve.
		Check lever linkage. Adjust or tighten as required.



PROBLEM	CAUSE	SOLUTION
Machine won't move (continued)	Hydrostatic pump/ motor defective.	Check hydrostatic components.  Check filter.  Repair or replace as required. See your authorized distributor. Check and release parking brake.
	Low oil.	Check oil level. Add as required.
	Filter plugged.	Replace return filter.
Brushes won't turn.	System cold.	Allow more time for system to warm up before using.
	Flow control valve plugged.	Open and re-adjust screw (refer to page OG 6:17).
	Defective electrical system.	Inspect all electrical connections. Clean, tighten or replace as required.  Control panel switch defective. Replace.  Wires damaged. Replace.  Defective solenoid valves. Replace.
Can't pick up trash.	No vacuum.	Trash container full. Empty con- tainer as required.
		Filter is clogged. Clean and wash more often.
		Obstruction in fan or suction path. Remove obstruction. Ensure machine is OFF and all moving parts are stopped.
		Fan doesn't turn. Clutch not engaged. Check electrical circuit.
		Container isn't sealed. Close cover. Check Wanderhose valve.



PROBLEM	CAUSE	SOLUTION
Can't pick up trash (continued)	No vacuum (continued)	Hole in intake tube. Replace intake tube.  Intake tube plugged. Clear obstruction from tube.  Tube improperly clamped. Tighten clamps.

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# Maintenance Section



PS 300

Compact  
Pedestrian Sweeper

Part No 66473-M

Revision Level 06

Not Used	7
Hydraulic System	8
Electrical System	9
Water System	10
Not Used	11
Not Used	12
Not Used	13
Not Used	14
Not Used	15
Not Used	16

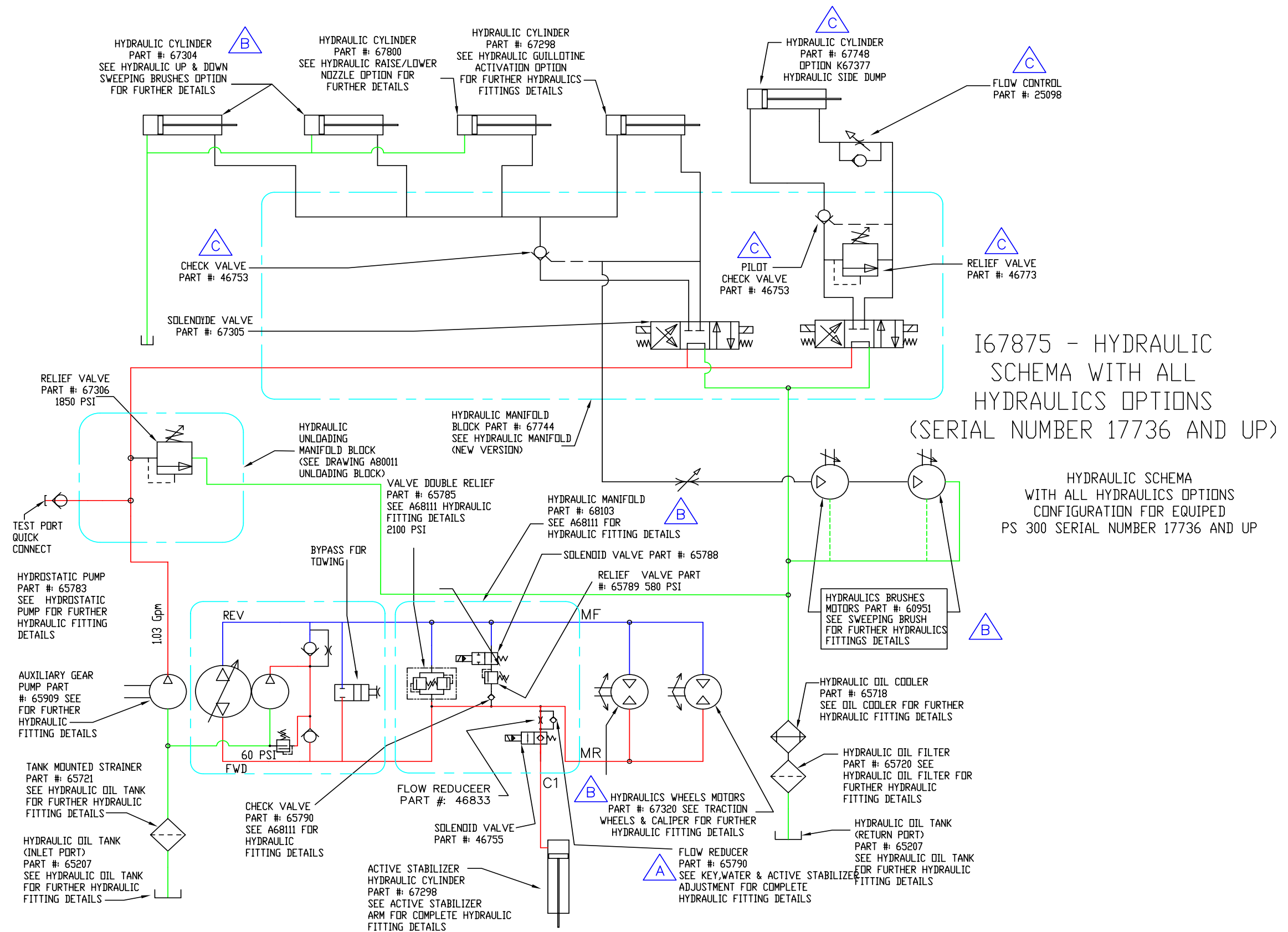
# CHAPTER 8

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## Hydraulic Section

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# CHAPTER 9

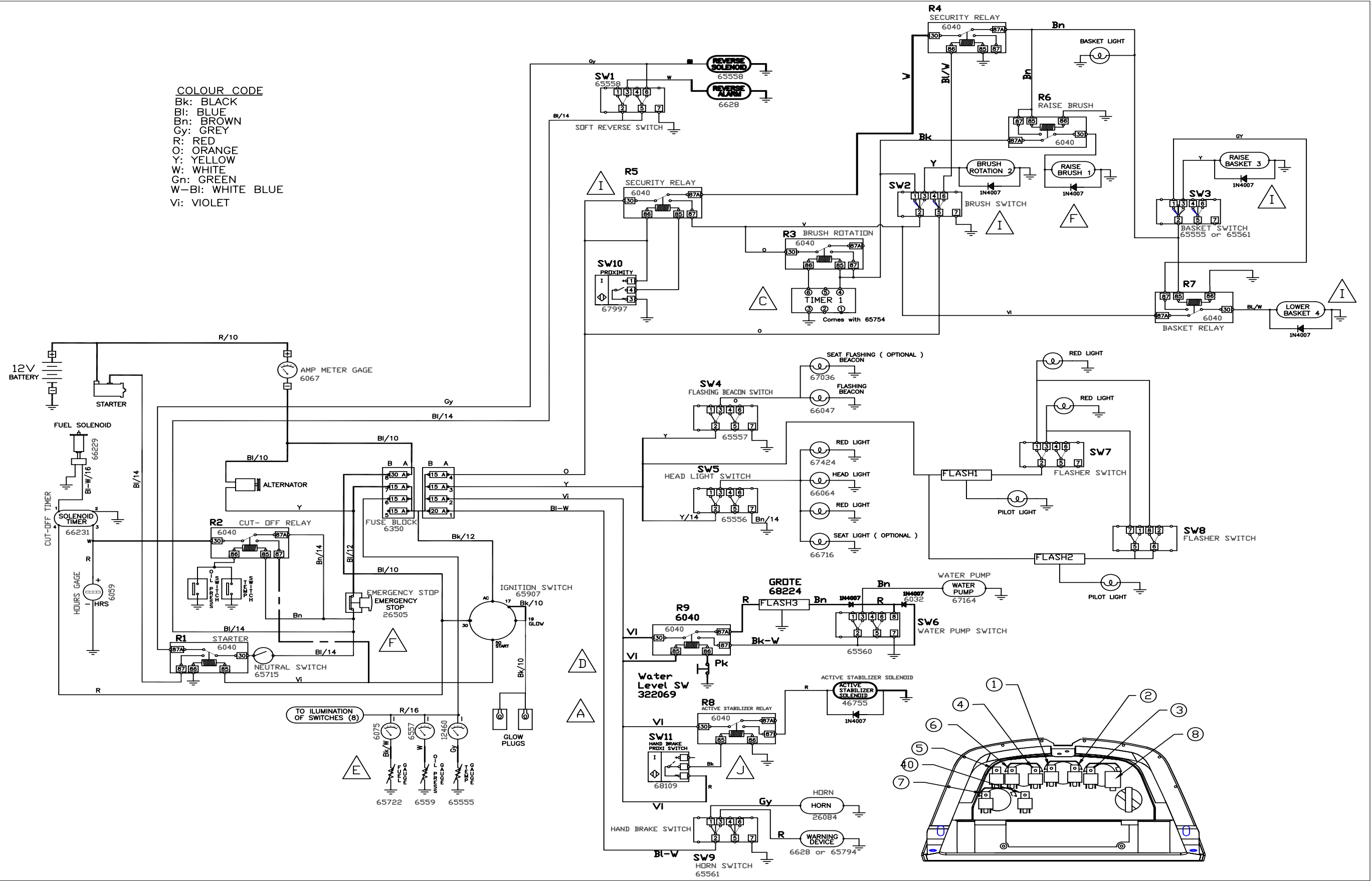
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## Electrical Section

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